

MASONRY TECHNOLOGY

Program of Studies
2014-2015



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Masonry Technology

Course Title	Post-Secondary Connection	Valid Course Code	Recommended Grade Level							Recommended Credit
						9	10	11	12	
Advanced Masonry	MASE 205 (MSY)	460113							X	1
Anchor & Reinforcement	MASE 245 (MSY)	460117						X	X	1
Fireplace Construction	MASE 275 (MSY)	460118							X	1
Industrial Safety	ISX 100	460301				X	X	X		.5
Intermediate Masonry	MASE 115 (MSY)	460116						X	X	1
Introduction to Masonry	MASE 105 (MSY)	460112					X	X	X	1
Introduction to Masonry Lab	MASE 215 (MSY)	460111					X	X	X	1
Special Problems III (Masonry)	MASE 291 (MSY)	460179							X	1
Basic Blocklaying	MASE 104 (MSY)	460110						X	X	1
Basic Bricklaying	MASE 103 (MSY)	460109						X	X	1
Workplace Principles	WPP 200	060191						X	X	.5
Internship	MASE 198 (MSY)	460183							X	1
Co-op	MASE 199 (MSY)	460180							X	1
Digital Literacy	DLC 100	480101					X	X	X	.5

MASONRY TECHNOLOGY

Program Description

The Construction Technology programs will prepare students for work in new construction, remodel, and energy auditing industries. Course offerings include everything from entry level trades courses, all the way to national certification. Students will train at the career centers, high schools and at real jobsites. Current and traditional building practices are included, while updated and advanced framing techniques, energy efficiency, health and safety, and sustainability methods are emphasized.

Construction Pre-Apprenticeship courses are included that focus on new construction, carpentry, and other building trades. Students learn about the tools and techniques used in the construction industries. The students may gain skills in Air Conditioning Technology, Building and Apartment Maintenance, Carpentry, Electrical Technology, Masonry and Plumbing. They are also introduced to green building methods and materials. The Building Performance and Energy Assessment courses shift that focus to analyzing existing homes.

Weatherization, Building Performance and Energy Assessment industries are helping families reduce their energy burden, while maintaining comfort and safety. Our students will learn the national standard and protocols for energy auditing, combustion appliance safety, and energy modeling. Successful students are prepared to take the national certification exams for building analysts and energy auditors.

Course offerings are intended to promote career ladders for those just entering the industry, as well as industry professionals looking to stay current. There are multiple certificates and degree options and inter-related disciplines at the Career Centers having articulation agreements with various post secondary institutions.

MODEL COURSE SEQUENCE

KDE Career Pathways MASONRY 2014-2015		
Career Pathway	Core Courses	Elective Courses
Bricklayer Helper CIP 46.0101.00 <u>Tests for Certification:</u> <ul style="list-style-type: none"> • KOSSA – Construction • NCCER – Core Curriculum • NCCER – Masonry Level 1 	<ul style="list-style-type: none"> • Industrial Safety 460301 • Intermediate Masonry 460116 • Intro to Masonry 460112 • Masonry LAB 460111 	<ul style="list-style-type: none"> • Workplace Principles 060191 • Personal Financial Management 060170 • CO-OPI Masonry 460180 • Internship Masonry 460183 • Digital Literacy 480101
Mason Apprentice CIP 46.0101.01 <u>Tests for Certification:</u> <ul style="list-style-type: none"> • KOSSA – Construction • NCCER – Core Curriculum • NCCER – Masonry Level 1 	<ul style="list-style-type: none"> • The Bricklayer Helper pathway must be completed then : • Advanced Masonry 460113 • Anchors & Reinforcement 460117 • Basic Bricklaying 460109 • Basic Blocklaying 460110 	<ul style="list-style-type: none"> • Fireplace Construction 460118 • CO-OP Masonry 460180 • Personal Financial Management 060170 • Workplace Principles 060191 • Special Problems III 460179

SAMPLE CAREER PATHWAY/CARPENTRY

SAMPLE

KENTUCKY CAREER PATHWAY/PROGRAM OF STUDY TEMPLATE										
						sonry				Standard 1A
	COLLEGE/UNIVERSITY	Somerset Community Technical College					CLUSTER:	Construction		
							PATHWAY:	Construction Technology		
	HIGH SCHOOL(S)	Pendleton Co HS/Pendleton Co HS/Silver Grove HS/Highlands HS					PROGRAM:	Construction		
	GRADE	ENGLISH	MATH	SCIENCE	SOCIAL STUDIES	REQUIRED COURSES RECOMMENDED ELECTIVE COURSES OTHER ELECTIVE COURSES CAREER AND TECHNICAL EDUCATION COURSES			CREDENTIAL CERTIFICATE DIPLOMA DEGREE	SAMPLE OCCUPATIO NS
	9	English I	Algebra I	Earth Science	Economics	History, PE, & Appreciation of Visual and Performing Arts	Intro to Construction	Digital Literacy		
	10	English II	*See Construction Geometry	Biology	U.S. History	Construction Safety	*Construction Geometry	Basic Construction		
	11	English III	Algebra II	Physical Science	World Geography	Intro to Masonry	Intermediate Masonry	Industrial Safety	Masonry LAB	Bricklayer Helper
	12	English IV	4th Math			MSY 251	Anchor & Reinforcement	Advanced Masonry	Special Problems	Mason Tender/Mason Apprentice
		Take Compass test - Apply for admission to KCTCS							Career Pathways	
	Year 13	Writing	Math	Science	Computer Applications	BRX-220	MSY-225	MSY-235 & MSY-198/199		
	Year 14	Oral Communication		Humanities	Social Interaction	MSY-298/299	CIS-100 & HIS-108, or ENG-101 or COM-282	MSY 255 & 275	Construction Mason's Diploma	Construction Technology
		Apply for admission to Eastern Kentucky University								
	Year 15	Communications	Humanities	Psychology	Economics	Construction Contracts	Estimating II	Occupational Safety		
	Year 16	Arts and Humanities	Math	Science		Structural Systems	Strength of Materials	Surveying	Bachelor's Degree	
						Required Courses				
						Recommended Elective Courses				
						Other Elective Courses				
						Career and Technical Education Courses				
						Credit-Based Transition Programs (e.g. Dual/Concurrent Enrollment, Articulated Courses, 2+2+2)				
						(♦ =High School to Comm. College) (• =Com. College to 4-Yr Institution) (■ = Opportunity to test out)				
						Mandatory Assessments, Advising, and Additional Preparation				
						Note: Categories of courses (e.g. Required, Recommended Electives, other Electives and career and Technical Education) apply to both secondary and postsecondary levels.				

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	Workplace Principles	
	0660191	
Course Description		
Workplace Principles examine the changing workforce and the skills needed to adapt to constantly changing demands and expectations. The course includes, but is not limited to, problem solving, teamwork, time management, and self-management skills. Job-seeking and job-retention skills are taught through the development of resumes and job search materials. Maximum benefit is received if this course is taken in the latter part of the student's course work.		
Content/Process		
1	Describe and apply the problem-solving processes independently and in groups	
2	Describe the importance of teamwork and apply teamwork skills	
3	Identify barriers to full team participation (sexual harassment, diversity, Americans with Disabilities Act, inhibiting behaviors)	
4	Apply conflict resolution skills in team situations (i.e., workplace violence)	
5	Describe the importance of time and self-management in the workplace	
6	Describe personal performance skills (i.e., appropriate dress, business protocol, personality traits, customer relations skills, and professional behavior)	
7	Describe the steps to take advantage of transition opportunities (i.e., lifestyle change, employment change)	
8	Develop an employment portfolio including a cover letter, resume, and reference page	
9	Identify sources for job leads and employer contacts	
10	Complete application forms	
11	Prepare and practice for job interviews	
12	Practice job follow-up strategies (job acceptance and job rejection)	
13	Review pre-employment tests	
14	Identify policies and procedures for a drug-free workplace, workers' compensation, Family Medical Leave Act, grievance policy, unemployment compensation, and business ethics	
15	Identify ergonomics and understand why ergonomics is important from a health point of view.	

16	Demonstrate accountability of and the safe and responsible use of company resources, office equipment, machines, etc.	
17	Apply Internet etiquette and safety	
18	Identify safety rules applicable to this course and demonstrate appropriate observance of said rules, including but not limited to, trip hazards, electrical cords and outlets, evacuation procedures for emergency situations (including fire, tornado, bomb threat, earthquake, etc.), lockdown procedures for emergency situations, location and contents of first aid kit, MSDS sheets, etc.	

Connections:

***Common Core State Standards**

***KOSSA**

***Common Core Technical Standards**

***New Generation Science Standards**

***Post-Secondary: KCTCS WPP 200**

CTSO's – Skills USA

	<div>Digital Literacy</div> <div>480101</div>	
Course Description		
The impact of computers on society, and ethical issues are presented. Students use microcomputer and application software, including word processing, database, spreadsheets, presentation software, and the Internet, to prepare elementary documents, reports, and electronic presentations.		
Content/Process		
1	Use a word processing program to create, save, print, modify, spell-check, and grammar-check a simple document	
2	Use a word processing program to enhance the appearance of a simple document by using centered, right-justified, boldfaced, underlined, and italicized text	
3	Use a word processing program to change the default margins and line spacing	
4	Use a word processing program to create a document with headers, footers, and footnotes	
5	Use an electronic spreadsheet to create, save, print, modify, and obtain graphs from a simple spreadsheet.	
6	Use an electronic spreadsheet to perform basic mathematical operations including, but not limited to addition, subtraction, multiplication, and division	
7	Use an electronic spreadsheet to calculate averages and percent's	
8	Use an electronic spreadsheet program to enhance the appearance of a spreadsheet by changing fonts, foreground and background colors; and centering text across columns	
9	Use a database management program to create, maintain, and print reports from a simple relational database	
10	Use a database management program to customize the user interface by creating and maintaining forms and reports	
11	Use a database management program to query tables using basic query operations such as "and", "or", "not", etc.	
12	Print in landscape and portrait orientations	

13	Use the component of the operating system that helps the user manipulate files and folders to copy, move, rename, and delete files; and to create, copy, move, rename, and delete folders	
14	Use a World Wide Web browser to navigate hypertext documents and to download files	
15	Use Internet search engines and understand their advantages and disadvantages	
16	Use an electronic mail program to send and receive electronic mail	
17	Discriminate between ethical and unethical uses of computers and information including e-mail and internet etiquette	
18	Demonstrate a basic understanding of issues regarding software copyright, software licensing, and software copying	
19	Demonstrate an awareness of computer viruses and a basic understanding of ways to protect a computer from viruses	
20	Demonstrate a basic understanding of the impact of computers on society	
21	Use and understand basic computer terminology	
22	Identify types of computers, how they process information and how individual computers interact with other computing systems and devices	
23	Identify the function of computer hardware components	
24	Identify the factors that go into an individual or organizational decision on how to purchase computer equipment	
25	Identify how to maintain computer equipment and solve common problems relating to computer hardware	
26	Identify how software and hardware work together to perform computing tasks and how software is developed and upgraded	
27	Identify different types of software, general concepts relating to software categories, and the tasks to which each type of software is most suited or not suited	
28	Identify what an operating system is and how it works, and solve common problems related to operating systems	
29	Manipulate and control the Windows desktop, files, and disks	
30	Identify how to change system settings, install and remove software	
31	Be able to start and exit a Windows application and utilize sources of online help	

32	Identify common on-screen elements of Windows applications, change application settings and manage files within an application	
33	Describe and implement the protocol of utilizing presentation software.	
34	Use a presentation program to create, save, modify, spell check, and grammar-check a simple presentation.	
35	Deleted Task	
36	Use a presentation program to enhance the appearance of the slide designs, background colors, and layout.	
37	Utilize the print features in a presentation to include handouts, speaker's notes, and black and white.	

Connections:

***Common Core State Standards**

***KOSSA**

***Common Core Technical Standards**

***New Generation Science Standards**

***Post-Secondary: KCTCS DLC 100**

CTSO's – Skills USA

	Industrial Safety 460301	
Course Description		
This course provides practical training in industrial safety. The students are taught to observe general safety rules and regulations, to apply work site and shop safety rules, and to apply OSHA regulations. Students are expected to obtain certification in first aid and cardiopulmonary resuscitation.		
<i>Prerequisites: None</i>		
Content/Process		
1	Apply work site and lab safety procedures	
2	Apply personal safety rules and procedures	
3	Apply fire prevention rules and procedures	
4	Obtain first aid certification	
5	Obtain CPR certification	
6	Demonstrate hazardous communications procedures	
7	Describe and demonstrate universal precautions procedures	

Connections:

***Common Core State Standards**

***KOSSA**

***Common Core Technical Standards**

***New Generation Science Standards**

***Post-Secondary: KCTCS ISX 100**

CTSO's – Skills USA

	Basic Bricklaying		
	460109		
Course Description			
Demonstrate the proper and safe use of masonry tools and the various types of mortar and cement while laying block on the job site. The students will perform the skills used in bricklaying procedures; mixing mortar, use of the trowel, spreading mortar, making head/bed joints, laying masonry units. Demonstrate the different methods of spacing materials, the 6-8-10 method, use of the transit level, brick spacing, on laying straight, plumb brick to the line, and the use of a modular rule. This course will also include 10 hours of safety training required to receive the OSHA 10 card.			
Content/Process			
1	Proportion and mix mortars manually with a hoe and mortar box.		
2	Stock a mortar board or pan.		
3	Temper mortar.		
4	Layout building lines using Pythagorean theorem (6-8-10).		
5	Square corners with a 2' framing square.		
6	Determine coursing using a modular/brick spacing rule.		
7	Plumb and level with mason's 2' and 4' levels.		
8	Chalk a line.		
9	Carry brick with tongs.		
10	Spread mortar for brick.		
11	Butter head joints for brick.		
12	Dry bond brick.		
13	Lay brick to a line while holding bond.		
14	Lay closure brick.		
15	Finish joints with a variety of masonry tools.		
16	Demonstrate a safe work environment according to best practices in the masonry industry and OSHA standards.		

Connections:

*Common Core State Standards

*KOSSA

*Common Core Technical Standards

	<div>Basic Blocklaying</div> <div>460110</div>	
Course Description		
Demonstrate the proper and safe use of masonry tools and the various types of mortar and cement while laying block on the job site. The students will perform the skills used in Blocklaying procedures; mixing mortar, use of the trowel, spreading mortar, making head/bed joints, laying masonry units. Demonstrate the different methods of spacing materials, the 6-8-10 method, use of the transit level, block spacing, on laying straight, plumb block to the line, and the use of a modular rule. This course will also include 10 hours of safety training required to receive the OSHA 10 card.		
Content/Process		
1	Proportion and mix mortars manually with a hoe and mortar box.	
2	Stock a mortar board or pan.	
3	Temper mortar.	
4	Layout building lines using the Pythagorean theorem (6-8-10).	
5	Layout block corners and walls with tape measure.	
6	Square corners with a 2' framing square.	
7	Determining coursing using a modular rule.	
8	Plumb and level with mason's 2' and 4'levels.	
9	Chalk a line.	
10	Spread mortar for block.	
11	Butter head joints for block.	
12	Dry bond block.	
13	Lay block to a line while holding bond.	
14	Lay closure block.	
15	Finish block using a convex jointer.	
16	Practice a safe work environment according to best practices in the masonry industry.	

Connections:***Common Core State Standards*****KOSSA*****Common Core Technical Standards*****New Generation Science Standards*****Post-Secondary: KCTCS MASE 104****CTSO's – Skills USA**

	Introduction to Masonry Class 460112 Lab 460111	
Course Description		
Introduce various types of mortar and cement along with the use of basic masonry tools. Emphasizes the different methods of spacing materials on a construction site, the 6-8-10 method, and use of the transit level, brick spacing, and modular rule. Focusing on laying straight and plumb brick to the line, bricking gables and building columns. Permits application techniques for setting up different types of masonry materials, marking off layout lines, and erecting batter boards along with techniques employed in different types of weather and climates. Laboratory.		
Content/Process		
1	Proportion and mix mortars manually with a hoe and mortar box	
2	Set up and maintain a mortar mixer	
3	Proportion and mix mortar with electric and gasoline powered mixers	
4	Set up and maintain masonry saws	
5	Stock a mortar board or pan	
6	Temper mortar	
7	Lay out building lines using the 6-8-10 method	
8	Square corners with a framing square	
9	Determine coursing with a brick spacing rule and with a modular mason's rule	
10	Determine coursing with a modular mason's rule	
11	Drop jack lines	
12	Set corner poles for veneer	
13	Set freestanding corner poles	
14	Plumb and level with a mason's 2- and 4-foot levels	
15	Plumb with a plumb bob	

16	Chalk a line	
17	Set lines, pins, blocks, and trigs	
18	Inspect, assemble, and disassemble rigging and scaffolding	
19	Carry brick with tongs	
20	Cut masonry materials with hand tools	
21	Cut materials with a masonry saw	
22	Identify brick types	
23	Spread mortar for brick	
24	Make head joints for brick	
25	Lay inside and outside brick corner leads	
26	Gauge masonry walls with a mason's modular rule	
27	Dry bond brick	
28	Bond a brick wall for range with a rule	
29	Lay brick to a line while holding bond	
30	Tuck-point a wall	
31	Finish joints with a variety of tools	
32	Identify types of block	
33	Lay out block corners and walls with a tape measure	
34	Bond corners for all widths of block	
35	Spread mortar for block	
36	Lay inside and outside block corner leads	
37	Lay a block wall to a line	
38	Lay closure block/brick	
39	Lay 4" partition block walls, and cap block	
40	Install foundation vents	

Connections:

***Common Core State Standards**

***KOSSA**

***Common Core Technical Standards**

***New Generation Science Standards**

***Post-Secondary: KCTCS MASE 105**

CTSO's – Skills USA

	<div>Intermediate Masonry</div> <div>460116</div>	
Course Description		
Builds on proficiency in competencies learned in MASE 105. Focuses on laying straight and plumb brick to the line, emphasizing bricking gables and building columns. Laboratory.		
Content/Process		
1	Proportion and mix mortars manually with a hoe and mortar box	
2	Set up and maintain a mortar mixer	
3	Proportion and mix mortar with electric and gasoline powered mixers	
4	Set up and maintain masonry saws	
5	Stock a mortar board or pan	
6	Temper mortar	
7	Lay out building lines using the 6-8-10 method	
8	Determine coursing with a brick spacing rule and with a modular mason's rule	
9	Drop jack lines	
10	Set corner poles for veneer	
11	Plumb and level with a mason's 2- and 4-foot levels.	
12	Gauge-Plumb with a plumb bob	
13	Chalk a line	
14	Set lines, pins, block and trigs	
15	Inspect, assemble and disassemble rigging and scaffolding	
16	Carry brick with tongs	
17	Cut masonry materials with hand tools	
18	Cut materials with a masonry saw	
19	Identify brick types	
20	Spread mortar for brick	
21	Make head joints for brick	
22	Lay inside and outside brick corner leads	

23	Gauge masonry walls with a mason's modular rule	
24	Dry bond brick	
25	Bond a brick wall for range with a rule	
26	Lay brick to a line while holding bond	
27	Tuck-point a wall	
28	Finish joints with a variety of tools	
29	Identify types of block	
30	Lay out block corners and walls with a tape measure	
31	Bond corners for all widths of block	
32	Spread mortar for block	
33	Lay inside and outside block corner leads	
34	Lay a block wall to a line	
35	Lay closure block/brick	
36	Lay 4" partition block walls, and cap block	
37	Install foundation vents	
38	Top out veneer walls behind frieze boards	
39	Brick a gable	
40	Build brick columns	

Connections:

***Common Core State Standards**

***KOSSA**

***Common Core Technical Standards**

***New Generation Science Standards**

***Post-Secondary: KCTCS MASE 115**

CTSO's – Skills USA

	INTERNSHIP EDUCATION (Masonry)		
	460183		
Course Description			
The Practicum provides supervised on-the-job work experience related to the student's educational objectives. Students participating in the Practicum do not receive compensation.			
Content/Process			
1	Gain career awareness and the opportunity to test career choice(s)		
2	Receive work experience related to career interests prior to graduation		
3	Integrate classroom studies with work experience		
4	Receive exposure to facilities and equipment unavailable in a classroom setting		
5	Increase employability potential after graduation		
Connections: *Common Core State Standards *KOSSA *Common Core Technical Standards *New Generation Science Standards *Post-Secondary: KCTCS MASE 198 CTSO's – Skills USA			

	Cooperative Education I		
	460180		
Course Description			
Cooperative Education provides supervised on-the-job work experience related to the student's educational objectives. Students participating in the Cooperative Education program receive compensation for their work.			
Prerequisite: None			
Content/Process			
1	Gain career awareness and the opportunity to test career choice(s)		
2	Receive work experience related to career interests prior to graduation		
3	Integrate classroom studies with work experience		
4	Receive exposure to facilities and equipment unavailable in a classroom setting		
5	Increase employability potential after graduation		
6	Earn funds to help finance education expenses		
Connections: *Common Core State Standards *KOSSA *Common Core Technical Standards *New Generation Science Standards *Post-Secondary: KCTCS MASE 199 CTSO's – Skills USA			

	Advanced Masonry		
	460113		
Course Description			
The advanced course provides experience in laying quoin corners, bricking in around electrical and plumbing units, and laying door and window brick sills The student will construct expansion joints, piers, pilasters and retaining and splitface block walls.			
Prerequisite: MASE 105			
Content/Process			
1	Lay a quoin corner		
2	Construct obtuse angle brick corners		
3	Tooth a wall or corner		
4	Brick in electrical, plumbing, and air conditioning fixtures		
5	Lay door and window brick sills		
6	Clean walls with acid		
7	Determine elevations of foundation brick shelves		
8	Secure electrical, plumbing, and air conditioning fixtures, lines, and ducts in walls		
9	Lay block in a stack bond		
10	Construct expansion joints		
11	Construct piers		
12	Construct pilasters		
13	Construct a retaining wall		
14	Lay split face block walls		
Connections: *Common Core State Standards *KOSSA *Common Core Technical Standards *New Generation Science Standards *Post-Secondary: KCTCS MASE 205 CTSO's – Skills USA			

	Anchors and Reinforcement		
	460117		
Course Description			
This course presents different types of reinforcement used in masonry units such as installing wall ties and reinforcing wire, tying intersecting walls with metal ties, installing masonry anchor bolts, setting and anchoring door and window frames, and setting steel lintels and bearing plates. Students will also install dovetail ties to concrete, set preformed masonry lintels, and lay paving brick in a herringbone pattern.			
Prerequisites: None			
Content/Process			
1	Install wall ties		
2	Install reinforcing wire		
3	Tie intersecting walls with metal ties		
4	Install anchor bolts		
5	Set and anchor door and window frames		
6	Set steel lintels		
7	Set preformed masonry lintels		
8	Build a reinforced block lintel in place		
9	Set bearing plates		
10	Install dovetail ties to concrete		
Connections: *Common Core State Standards *KOSSA *Common Core Technical Standards *New Generation Science Standards *Post-Secondary: KCTCS MASE 245 CTSO's – Skills USA			

	Fireplace Construction		
	460118		
Course Description			
This course presents different types and styles of indoor and outdoor fireplaces, and the principles of layout, drafting, and drawing a fireplace. Finishing dimensions of fireplace opening, firebox layout, setting the flue lining, and applying a chimney cap are also included.			
Prerequisite: MASE 205			
Content/Process			
1	Lay out fireplaces		
2	Build ash pits with clean-out doors		
3	Enclose prefabricated fireboxes		
4	Install grills and ducts for prefabricated fireboxes		
5	Install fireplace inserts		
6	Lay brick with fireclay or high temperature mortar		
7	Construct fireboxes with ash dumps		
8	Install dampers		
9	Construct smoke chambers with smoke shelves		
10	Install flue liners		
11	Cut flue liners with hand tools		
12	Install thimbles		
13	Build chimneys		
14	Install roof flashing in joints and regrets		
15	Cap off chimneys		
Connections: *Common Core State Standards *KOSSA *Common Core Technical Standards *New Generation Science Standards *Post-Secondary: KCTCS MASE 275 CTSO's – Skills USA			

	Special Problems III 460179	
Course Description		
This course is designed for the student who has demonstrated specific special needs.		
Content/Process		
1	Selected tasks/problems as determined by the instructor	